

I/WE CLAIM:

1. An image tracking apparatus for tracking the movement of an image of a corresponding moving object, the apparatus comprising:
- 5 (a) an optical identifier device which attaches to said moving object and generates an optical identification signal; and
- (b) an image capture system for receiving said image of said moving object and said optical identification signal, and generating a coordinate position value related to said image of said moving object.
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2. The image tracking apparatus as claimed in claim 1, wherein said image capture system comprises:
- (a) a camera system for receiving said image of said moving object and said optical identification signal, and generating a first and second series of image frames; and
- 15 (b) a picture frame processing system for processing said second series of image frames and generating said coordinate position value related to said image of said moving object.
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3. The image tracking apparatus as claimed in claim 2, wherein said camera system comprises:
- (a) a first camera for receiving said image of said moving object and generating said first series of image frames; and
- 25 (b) a second camera for receiving said optical identification signal and generating said second series of image frames.

4. The image tracking apparatus as claimed in claim 3, wherein said first series of image frames include broadcast quality images of said moving object.

5 5. The image tracking apparatus as claimed in claim 4, wherein said second series of image frames include optically filtered image frames.

10 6. The image tracking apparatus as claimed in claim 5, wherein said second camera includes a narrow band optical filter which receives said image of said optical identification signal and generates said optically filtered image frames.

7 7. The image tracking apparatus as claimed in claim 6, wherein each of said optically filtered image frames include images of only said optical identification signal.

15 8. The image tracking apparatus as claimed in claim 7, wherein said picture frame processing system includes a coordinate detector, which receives said optically filtered image frames and generates an X and Y coordinate position signal for said optical identification signal within each of said optically filtered image frames.

20 9. The image tracking apparatus as claimed in claim 8, wherein said X coordinate position signal corresponds to a running average of X coordinate position values determined from each of said optically filtered image frames; and said Y coordinate position signal corresponds to a running average of Y coordinate position values within each of said optically filtered image frames.

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10. The image tracking apparatus as claimed in claim 9, wherein said picture frame processing system further includes a decoder, said decoder receiving said optical identification signal within each of said optically filtered image frames and generating an electrical decoder signal.
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11. The image tracking apparatus as claimed in claim 10, wherein said picture frame processing system includes a graphics generator, said graphics generator receiving said electrical decoder signal and generating a graphic image containing information associated with said image of said moving object.
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12. The image tracking apparatus as claimed in claim 11, further comprising a picture-in-picture processor which receives both said X and Y coordinate position signal and generates said coordinate position value.
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13. The image tracking apparatus as claimed in claim 12, wherein said picture-in-picture processor receives said broadcast quality images of said moving object and said graphic image, and superimposes said graphic image on said broadcast quality images of said moving object at a position related to said coordinate position value.
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14. The image tracking apparatus as claimed in claim 13, wherein said optical identifier device comprises:
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- (a) a laser controller for generating an electrical drive signal, said electrical drive signal including a unique identifier code; and
 - (b) a plurality of laser devices, wherein said electrical drive signal including said unique identifier code modulates said laser devices and generates said optical

identification signal.

15. The image tracking apparatus as claimed in claim 14, wherein said laser controller includes:

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- (b) a modulation controller device for receiving an enable signal and generating said electrical drive signal; and
 - (a) a synchronization device for generating said enable signal such that said electrical drive signal modulates said lasers in phase with said decoder device receiving said optical identification signal within each of said
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- optically filtered image frames.

16. The image tracking apparatus as claimed in claim 2, wherein said camera system includes a camera device comprising:

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- (a) an optical splitter system for receiving said image of said moving object and said optical identification signal, and generating a first and second optical signal along a first and second orthogonal path;
 - (b) a first camera device positioned along said first orthogonal path to receive said first optical signal and generate said first series of image frames ; and
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- (c) a second camera device positioned along said second orthogonal path to receive said second optical signal and generate said second series of image frames.

17. The image tracking apparatus as claimed in claim 16, wherein said optical splitter system comprises:

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- (a) a lens system for receiving said image of said moving object and said optical identification signal and producing a collimated optical beam;
 - (b) an optical beam splitter for receiving said collimated optical beam and producing a first collimated optical

output along said first orthogonal path; and producing a second collimated optical output along said second orthogonal path.

5 18. The image tracking apparatus as claimed in claim 17, further comprising a first and second focusing lens, wherein said first focusing lens receives said first collimated optical output and produces said first optical signal; and said second focusing lens receives said second collimated optical output and produces said second optical signal.

10 19. The image tracking apparatus as claimed in claim 18, wherein said first optical signal is said image of said moving object and said second optical signal is said optical identification signal.

15 20. The image tracking apparatus as claimed in claim 19, wherein said first series of image frames are image frames of said moving object; and said second series of image frames are optically filtered image frames of said optical identification signal.

20 21. The image tracking apparatus as claimed in claim 20, wherein said picture frame processing system includes a coordinate detector device, which receives said optically filtered image frames of said optical identification signal and generates an X and Y coordinate position signal for said optical identification signal within each of said optically filtered image frames.

25 22. The image tracking apparatus as claimed in claim 21, wherein said X coordinate position signal corresponds to a running average of X coordinate position values determined from each

of said optically filtered image frames; and said Y coordinate position signal corresponds to a running average of Y coordinate position values within each of said optically filtered image frames.

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23. The image tracking apparatus as claimed in claim 22, wherein said picture frame processing system further includes a decoder device, said decoder device receiving said optical identification signal within each of said optically filtered image frames of said optical identification signal and generating an electrical decoder signal.

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24. The image tracking apparatus as claimed in claim 23, wherein said picture frame processing system includes a graphics generator, said graphics generator receiving said electrical decoder signal and generating a graphic image corresponding to said image of said moving object.

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25. The image tracking apparatus as claimed in claim 24, further comprising a picture-in-picture processor which receives both said X and Y coordinate position signal and generates said coordinate position value.

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26. The image tracking apparatus as claimed in claim 25, wherein said picture-in-picture processor receives said broadcast quality images of said moving object and said graphic image, and superimposes said graphic image on said broadcast quality images of said moving object at a position related to said coordinate position value.

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27. A method of tracking the movement of an image of a corresponding moving object, the method comprising:

- (a) generating an optical identification signal at said moving object, as said moving object moves; and
- (b) receiving an image of said moving object and said optical identification signal, and generating a coordinate position value related to said image of said moving object.

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28. The method as claimed in claim 27, wherein said coordinate position value provides an X and Y position coordinate corresponding to said optical identification signal.

29. The method as claimed in claim 28, including determining an insertion position utilizing said X and Y position coordinates and inserting an information graphic image at said insertion position.

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